

F/G. 1

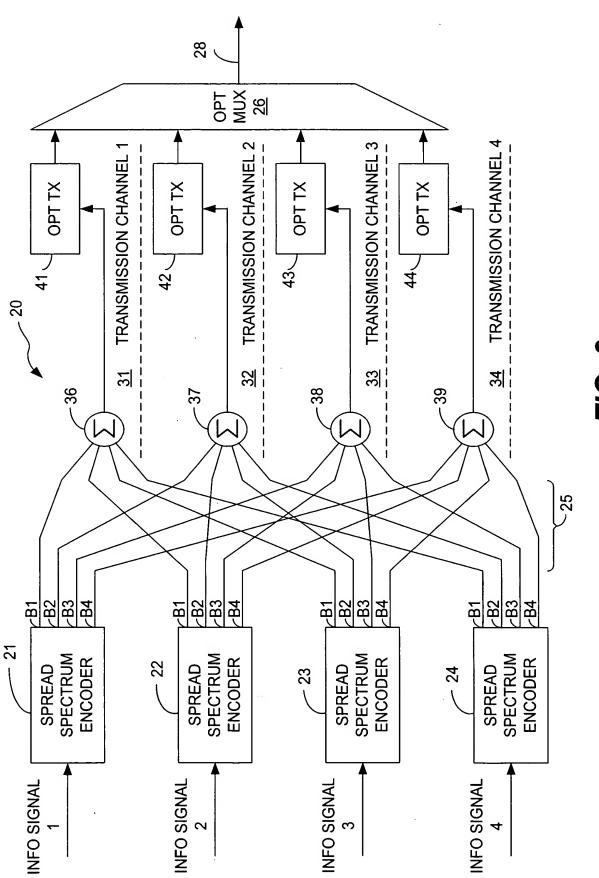


FIG. 2

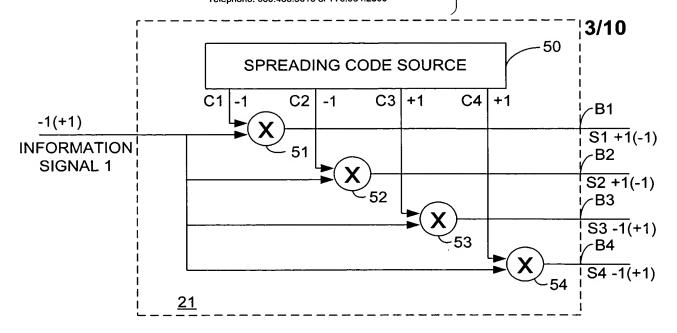


FIG. 3A

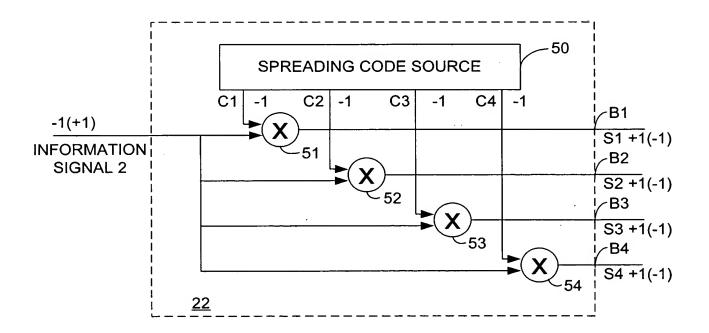


FIG. 3B

Serial No.: (New) Inventor: William R. Trutna, Jr. et al. Title: COMMUNICATION SYSTEM USING WAVELENGTH SPREAD-SPECTRUM CODING
Agilent Technologies Docket No.: 10004284-1
Attorney: Ian Hardcastle or Daniel J. Santos
Telephone: 650.485.3015 or 770.984.2300 4/10 50 SPREADING CODE SOURCE C3 C1 -1 C2 1 -1 C4 1 ∕B1 -1(+1) S1 +1(-1) **INFORMATION** - 51 -B2 SIGNAL 3 S2 -1(+1) - 52 i∕B3 S3 +1(-1) -B4 S4 -1(+1) <u>23</u>

FIG. 3C

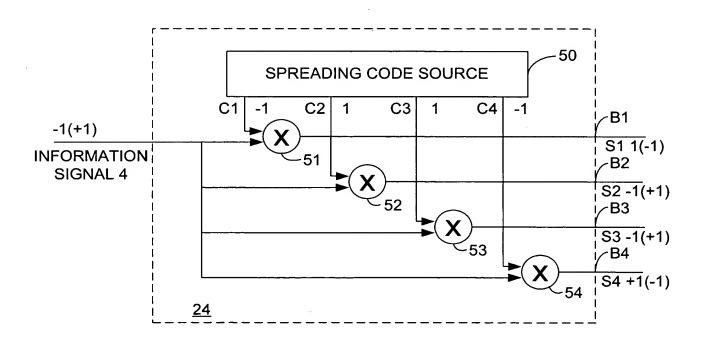
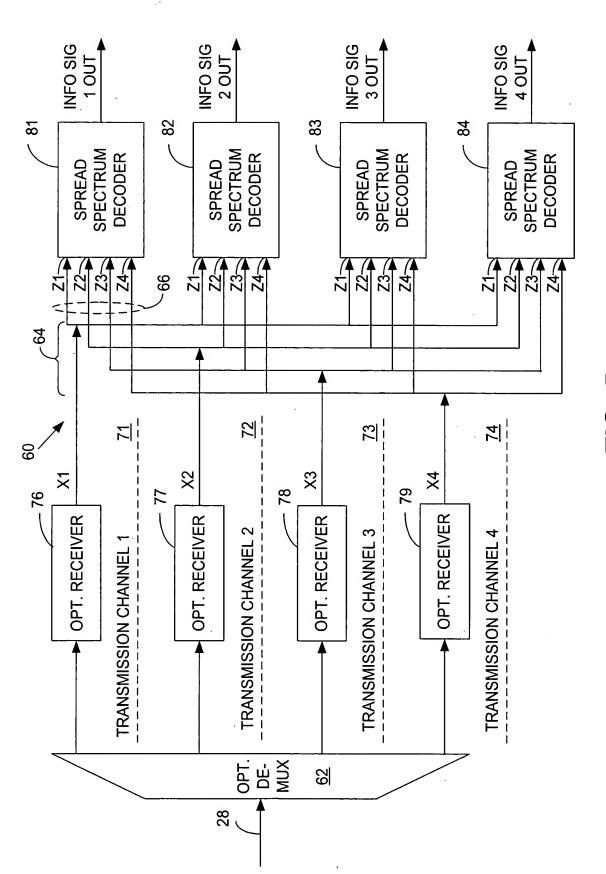


FIG. 3D

S-S.	Spreading	I.S.	Code Signal States				I.S. Code Signal States					
Enc.	Code	State	S1	S2	S3	S4	State	S1	S2	S3	S4	
21	-1-1+1+1	<u>-1</u>	+1	+1	<u>-1</u>	<u>-1</u>	-1	+1	+1	-1	<u>-1</u>	
22	-1-1-1-1	_1	+1	+1	+1	+1	-1	+1	+1	+1	+1	
23	-1+1-1+1	_1	+1	<u>-1</u>	+1	-1	-1	+1	-1	+1	-1	
24	-1+1+1-1	-1	+1	-1	<u>-1</u>	+1	+1	-1	+1	+1	-1	
Mod			+4	0	0	0		+2	+2	+2	-2	
21	-1-1+1+1	+1	–1	– 1	+1	+1	+1	-1	<u>-1</u>	+1	+1	
22	-1-1-1-1	-1	+1	+1	+1	+1	-1	+1	+1	+1	+1	
23	-1+1-1+1	– 1	+1	–1	+1	-1	-1	+1	-1	+1	-1	
24	-1+1+1-1	<u>-1</u>	+1	-1	–1	+1	+1	-1	+1	+1	-1	
Mod			+2	-2	+2	+2		0	0	+4	0	
21	-1-1+1+1	– 1	+1	+1	– 1	-1	<u>-1</u>	+1	+1	–1	<u>-1</u>	
22	-1-1-1-1	+1	–1	–1	-1	–1	+1	-1	<u>-1</u>	<u>-1</u>	-1	
23	-1+1-1+1	–1	+1	-1	+1	-1	<u>-1</u>	+1	<u>-1</u>	+1	–1	
24	-1+1+1-1	_1	+1	–1	-1	+1	+1	_1_	+1	+1	-1	
Mod		4	+2	-2	-2	-2		0	0	0	-4	
21	-1-1+1+1	+1	-1	-1	+1	+1	+1	-1	-1	+1	+1	
22	-1-1-1-1	+1	-1	-1	–1	–1	+1	–1	<u>-1</u>	<u>-1</u>	-1	
23	_1+1_1+1	-1	+1	_1	+1	-1	_1	+1	–1	+1	–1	
24	_1+1+1_1	_1	+1	_1	_1	+1	+1	_1	+1	+1	–1	
Mod			0	<u>-4</u>	0	0		-2	-2	+2	-2	
21	-1-1+1+1	-1	+1	+1	–1	-1	–1	+1	+1	–1	– 1	
22	_1_1_1_1	_1	+1	+1	+1	+1	_1	+1	+1	+1	+1	
23	_1+1_1+1	+1	–1	+1	_1	+1	+1	–1	+1	_1	+1	
24	_1+1+1_1	_1	+1	_1	_1	+1	+1	_1	+1	+1	_1	
Mod			+2	+2	- 2	+2		0	+4	0	0	
21	-1-1+1+1	+1	_1	<u>-1</u>	+1	+1	+1	-1	-1	+1	+1	
22	-1-1-1-1	_1	+1	+1	+1	+1	<u>-1</u>	+1	+1	+1	+1	
23	-1+1-1+1	+1	<u>-1</u>	+1	<u>-1</u>	+1	+1	_1	+1	–1	+1	
24	-1+1+1-1	_1	+1	_1	<u>-1</u>	+1	+1	1	+1	+1	–1	
Mod			0	0	0	+4		-2	+2	+2	+2	
21	-1-1+1+1	-1	+1	+1	_1	<u>-1</u>	–1	+1	+1	_1	-1	
22	-1-1-1	+1	_1	_1	-1	_1	+1	<u>-1</u>	_1	_1_	_1	
23	_1+1_1+1	+1	<u>-1</u>	+1	_1	+1	+1	–1	+1	_1	+1	
24	_1+1+1_1	<u>∸</u> 1	+1	_1	<u>-1</u>	+1	+1	_1	+1	+1	_1	
Mod			0	0	-4	0		-2	+2	– 2	–2	
21	-1-1+1+1	+1	-1	–1	+1	+1	+1	-1	-1	+1	+1	
22	_1_1_1_1	+1	–1	–1	-1	_1	+1	-1	_1	-1	<u>-1</u>	
23	-1+1-1+1	+1	–1	+1	-1	+1	+1	–1 -	+1	_1	+1	
24	-1+1+1-1	_1	+1	<u>-1</u>	_1	+1	+1	_1	+1	+1	<u>-1</u>	
Mod			-2	-2	-2	+2		_4	0	0	0	

Fig. 4

6/10



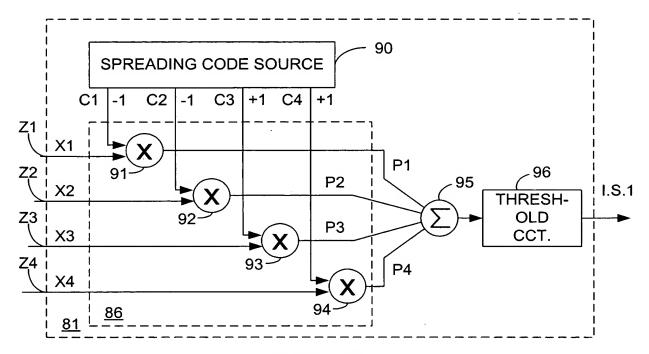


FIG. 6

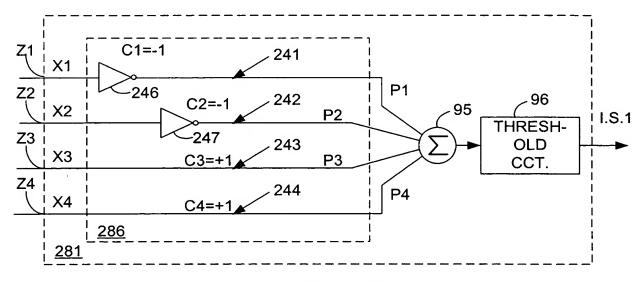


FIG. 10

S-S	Spread.					Sum		Product States			Sum
Dec	Code	P1	P2	P3	P4		P1	P2	P3	P4	
ļ	Ch. Sig.	+4	0	0	0		+2	+2	+2	-2	
81	_1_1+1+1	-4	0	0	0	-4	-2	-2	+2	– 2	-4
82	-1-1-1-1	-4	0	0	0	-4	-2	-2	- 2	+2	-4
83	-1+1-1+1	-4	0	0	0	-4	-2	+2	-2	-2	-4
84	-1+1+1-1	-4	0	0	0	-4	-2	+2	+2	+2	+4
	Ch. Sig.	+2	-2	+2	+2		0	0	+4	0	
81	-1-1+1+1	– 2	+2	+2	+2	+4	0	0	+4	0	+4
82	-1-1-1-1	-2	+2	-2	-2	-4	0	0	-4	0	-4
83	-1+1-1+1	-2	-2	-2	+2	-4	0	0	-4	0	-4
84	-1+1+1-1	–2	-2	+2	-2	-4	0	0	+4	0	+4
	Ch. Sig.	+2	-2	-2	-2		0	0	0	-4	
81	-1-1+1+1	-2	+2	-2	-2	-4	0	0	0	+4	-4
82	-1-1-1-1	-2	+2	+2	+2	+4	0	0	0	-4	+4
83	-1+1-1+1	-2	-2	+2	-2	-4	0	0	0	-4	-4
84	-1+1+1-1	-2	-2	-2	+2	-4	0	0	0	+4	+4
	Ch. Sig.	0	-4	0	0		-2	-2	+2	-2	
81	-1-1+1+1	0	+4	0	0	+4	+2	+2	+2	-2	+4
82	-1-1-1-1	0	+4	0	0	+4	+2	+2	-2	+2	+4
83	-1+1-1+1	0	-4	0	0	-4	+2	-2	-2	-2	-4
84	-1+1+1-1	0	-4	0	0	-4	+2	-2	+2	+2	+4
	Ch. Sig.	+2	+2	-2	+2		0	+4	0	0	
81	-1-1+1+1	-2	-2	-2	+2	-4	0	-4	0	0	-4
82	-1-1-1-1	-2	-2	+2	-2	-4	0	-4	0	0	-4
83	-1+1-1+1	-2	+2	+2	+2	+4	0	+4	0	0	+4
84	-1+1+1-1	-2	+2	-2	-2	-4	0	+4	0	0	+4
	Ch. Sig.	0	0	0	+4		-2	+2	+2	+2	
81	-1-1+1+1	0	0	0	+4	+4	+2	-2	+2	+2	+4
82	-1-1-1-1	0	0	0	-4	-4	+2	-2	-2	-2	-4
83	-1+1-1+1	0	0	0	+4	+4	+2	+2	-2	+2	+4
84	-1+1+1-1	0	0	0	-4	-4	+2	+2	+2	-2	+4
	Ch. Sig.	0	0	-4	0		-2	+2	-2	-2	
81	-1-1+1+1	0	0	-4	0	-4	+2	-2	-2	-2	-4
82	-1-1-1-1	0	0	+4	0	+4	+2	-2	+2	+2	+4
83	-1+1-1+1	0	0	+4	0	+4	+2	+2	+2	-2	+4
84	-1+1+1-1	0	0	-4	0	-4	+2	+2	-2	+2	+4
	Ch. Sig.	– 2	– 2	– 2	+2		-4	0	0	0	
81	-1-1+1+1	+2	+2	-2	+2	+4	+4	0	0	0	+4
82	-1-1-1-1	+2	+2	+2	-2	+4	+4	0	0	0	+4
83	-1+1-1+1	+2	-2	+2	+2	+4	+4	0	0	0	+4
84	-1+1+1-1	+2	-2	-2	-2	-4	+4	0	0	0	+4

Fig. 7

Serial No.: (New)
Inventor: William R. Trutna, Jr. et al.
Title: COMMUNICATION SYSTEM USING WAVELENGTH
SPREAD-SPECTRUM CODING Agilent Technologies Docket No.: 10004284-1 Attorney: Ian Hardcastle or Daniel J. Santos Telephone: 650.485.3015 or 770.984.2300 9/10 50 SPREADING CODE SOURCE C1 C2 -1 C3 +1 -1 C4 +1 /B1 -1(+1) $\overline{S1} + 1(-1)$ 151 **INFORMATION** B2 SIGNAL 1 S2 +1(-1) -152 ∠B3 S3 -1(+1) ⁻153 ∕B4 S4 -1(+1) - 154 121 FIG. 8 231 C1 = -1-B1 -1(+1) S1 +1(-1) INFORMATION 236 232 C2 = -1∠B2 SIGNAL 1 S2 + 1(-1)-237 233 ~B3 C3 = +1S3 -1(+1) 234 C4=+1 ∕B4 S4 -1(+1) <u>221</u> FIG. 9A 231 C1 = -1-B1 -1(+1) S1 +1(-1) **INFORMATION** -236 232 C2 = -1∠B2 SIGNAL 2 S2 +1(-1) -237 233 C3 = -1~B3 S3 + 1(-1)-238 234 C4 = -1~B4 S4 + 1(-1)-239 <u>222</u> FIG. 9B

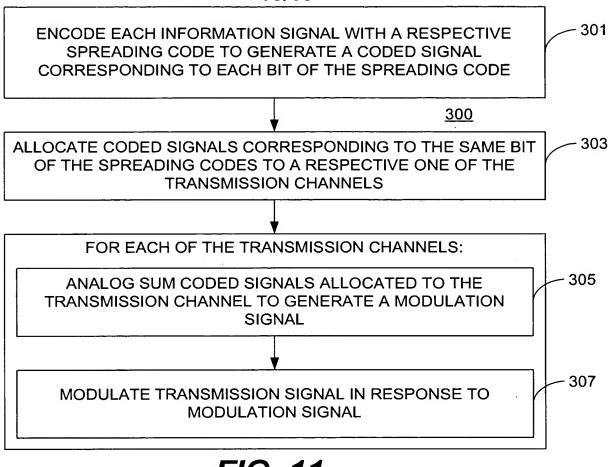


FIG. 11

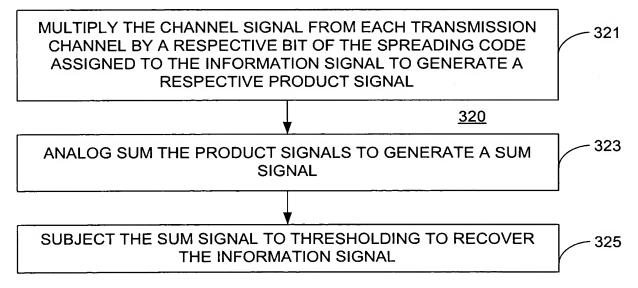


FIG. 12